

Of course, a zealous and persistent botanist will surmount all these difficulties in one manner or another, but it will be seen from my account that it is no easy task to collect and preserve the members of the Paraguayan flora. Begonias, which abound here, and other succulent plants, are exceedingly difficult of management. Some plants, like the *Calamus*, can not be dried in any decent shape, and others, like the *Victoria regia* and several of the *Cacti*, can not be preserved at all. They will mould or rot in despite of every expedient. Many specimens must be preserved, if at all, in fragments, and pieced together upon the mounting paper.

Notwithstanding all this, I have managed to get together about 750 species and some 8,000 specimens, which I trust will be in a sufficiently good condition when they get home to be identified and to make a valuable addition to the herbaria of the United States.

Asuncion, Paraguay.

The grasses of Roane Mountain.

BY F. LAMSON SCRIBNER.¹

Roane Mountain, lying on the border line between Tennessee and North Carolina, has been made famous as the botanizing ground of some of our best botanists, including even Dr. Gray, who first visited it in 1841, and its flora possesses a peculiar as well as a historical interest. In the old register of the hotel are recorded the finds of the several botanists or botanical parties who have visited the locality. The first of these was made in 1878 by Dr. Geo. Vasey, who, under the head of "Grasses of Roane Mountain," enumerates the four or five species observed by him.

As the guest of Mr. C. M. McClung, a prominent business man of Knoxville, Tennessee, and an enthusiastic student of North American plants, I spent a few of the last days of July of the present season upon the mountain, and improved the occasion by investigating the grasses of the locality. As the result of three days' rather diligent search, we together found on or near the mountain summit (all at an elevation of over 6,000 ft. above sea level) twenty-five species, of which the following is a list:²

¹ Read before Section F, at the Toronto meeting of the A. A. A. S. 1889.

² I have already, in a paper read before the Society for the Promotion of Agricultural Science at the Toronto meeting, considered the grasses of this region from an agricultural aspect.

Phleum pratense L.
 Agrostis perennans Tuck.
 " scabra Willd.
 " rupestris Chapm.³
 " alba L.
 Cinna pendula Trin.
 Brachyelytrum aristatum Beauv.
 Calamagrostis Canadensis Beauv.
 Dactylis glomerata L.
 Eatonia Pennsylvanica Gray.
 Glyceria elongata Trin.
 Poa annua L.
 " compressa L.

Poa pratensis L.
 " alsodes Gray.
 Festuca elatior L.
 " nutans Willd.
 Bromus ciliatus L.
 Elymus striatus Willd.
 Asprella Hystrix Willd.
 Danthonia spicata Beauv.
 " compressa Austin.
 Trisetum subspicatum, var. molle Gray.
 Deschampsia flexuosa Griseb.
 Holcus lanatus L.



Agrostis rupestris Chapm., figured from specimen from Roane Mt., N.C. a, apex fl. glume; b, floret; c, spikelet; d, group of three spikelets.

Some of these species had evidently been introduced, for example *Dactylis glomerata*, *Festuca elatior*, *Phleum pratense* and *Holcus lanatus*, but all among those not natives, excepting the orchard grass and tall fescue, were well established. *Deschampsia flexuosa*, growing in exposed situations on rocks and ledges, was one of the most conspicuous and showy species. *Poa annua* was everywhere along the roads and walks and about the hotel. *Poa pratensis* and *P. compressa* were quite generally distributed, and so were the several species of *Agrostis*, excepting *A. rupestris* which was found only at High Bluff about a half mile southwest from the hotel. *Glyceria elongata* was seen growing rather abundantly along a stream near the mountain summit and I mention it particularly to call attention to the fact of the discovery of this northern grass within the southern states. For the same reason I would speak of the finding of *Trisetum subspicatum* var. *molle*. *Poa alsodes*, found several years ago on Black Mountain by Mr. Wm. M. Canby, was seen at several points, but not in any quantity. *Danthonia spicata* occupied its usual station in dry soil

³This is the *Agrostis rupestris* of Chapman's Flora, but its identity with the plant of Allione may be questioned. The same form occurs on the mountains of New England.

along the ridges and bluffs. *Danthonia compressa*, distinguished by its greener color, much longer and more abundant leaves, taller culms, more elongated panicles and especially by the longer teeth to the flowering glumes, was the most abundant species of all and the chief component of the luxuriant and dense turf covering the extensive meadows of the treeless areas on the mountain top. The abundance of this grass and the excellent condition of the cattle grazing on it clearly showed its importance as a forage plant. It is a species found along the mountains from the Carolinas and Tennessee to New England, and wherever it grows abundantly yields excellent fodder for horses and cattle. A cool climate and abundant atmospheric humidity are apparently essential to its best growth.

Another species of *Danthonia*, viz., *Danthonia Californica*, especially the variety *unispicata*, occupies a similar position with respect to its abundance and value for forage, in the mountain meadows or "deer parks" of the Rocky Mountains in Montana.

The principal native fodder grasses of the high mountain meadows, or as they are familiarly termed in the west, "deer parks," are:

For the Alleghanies:

Danthonia compressa Austin.

For the Rocky Mountains in Montana:

Danthonia Californica var. *unispicata* Thurb.

Danthonia intermedia Vasey.

Festuca scabrella Torr.

Alopecurus occidentalis Scribn.

For the mountains of Arizona:

Poa Californica Vasey.

Muhlenbergia virescens Trin.

Muhlenbergia gracilis Trin.

Knoxville, Tenn.

Pickereel weed pollen.¹

BYRON D. HALSTED.

The flowers of the pickereel weed (*Pontederia cordata* L.) are strictly trimorphic, as was determined by Mr. W. H. Leggett in 1875. There are six stamens in each blossom, placed in two sets of three each, and a single style. The

¹Read before the Botanical Club of the A. A. S., at the Toronto meeting, 1889